

INTERCONNECT STRUCTURE IMPROVEMENTS

Abstract

Methods and conductive interconnect structures are provided for preventing cracks in a dielectric layer on a substrate. Substantially half cylindrical or cylindrical trench openings are formed within at least one dielectric layer, which are then filled with a high conductivity metal for forming substantially half cylindrical or cylindrical wires. The rounded bottom portions of the substantially half cylindrical wires, or the rounded bottom and top portions of the substantially half cylindrical wires, avoid any propagation points for starting cracks in the dielectric layer, as compared to conventional rectangular conductors having angled edges, which in fact are propagation points for initiating cracks. The substantially half cylindrical or cylindrical wires also reduce the line-to-line capacitance between neighboring wires, substantially eliminate any high stress points in the dielectric layer, reduce mechanical stresses induced on the IC and increase the overall mechanical strength of the IC.